

***Critical Review of the IPIECA  
Petroleum Industry Guidelines  
for Reporting Greenhouse Gas  
Emissions***

CONSULTANT REPORT (DRAFT)

April 15, 2005

# CALIFORNIA ENERGY COMMISSION

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IPIECA Petroleum  
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Gas Emissions  
(DRAFT)***

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# 1. Introduction

The California Climate Action Registry will soon be developing a greenhouse gas protocol for California's oil and gas industries. As directed by SB527 (Sher, 2001), the California Energy Commission provides assistance to the Climate Action Registry in development of protocols to quantify, report and certify greenhouse gas emissions for use by its participants. In support of the upcoming oil and gas industry protocol development effort, TIAX LLC has been requested to critically review IPIECA's *Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions*<sup>1</sup>, determine its applicability to California's oil and gas industries, and evaluate its consistency with the Registry's General Reporting and Certification Protocols.<sup>2,3</sup>

The California Climate Action Registry general reporting and certification protocols are referred to in this report as the "CCAR Protocols". The IPIECA Petroleum Industry Guidelines document is referred to as the "IPIECA document". The IPIECA document is largely based on the 2004 edition of the WRI/WBCSD Greenhouse Gas Protocol<sup>4</sup>. In fact, much of the material in the IPIECA document was taken directly from the original and revised WRI protocols and supplemented with petroleum industry information.

The IPIECA document is intended to be a companion document to the American Petroleum Institute's *Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry* published in 2001. Similarly, this report is intended to be a companion document to a separate review of the API Compendium prepared by ICF Consulting, Inc... As a result, this report focuses on the accounting and reporting of emissions at the corporate level while the ICF report focuses on emission quantification methodologies.

While reading this document it is important to keep in mind that the IPIECA Guidelines document is not a reporting protocol for a specific program. Rather it is intended as an overarching set of guidelines for entities to use as they comply with reporting protocols of the various programs it may choose or be required to participate in. As such, the IPIECA document *advises* and *encourages* reporting entities, but can not *require* actions in the manner of the CCAR protocols, which were written specifically for reporting to the California Climate Action Registry.

Before stepping through GHG reporting and certification issues, a brief description of California's oil and gas industries is provided in Section 2. Section 3 provides an issue by issue comparison of the IPIECA guidelines to the CCAR protocols.

<sup>1</sup> *Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions*, December 2003, International Petroleum Industry Environmental Conservation Association".

<sup>2</sup> California Climate Action Registry, General Reporting Protocol Version 2.0, October 2003.

<sup>3</sup> California Climate Action Registry, Certification Protocol, Version 2, July 2003.

<sup>4</sup> *A Corporate Accounting and Reporting Standard*, Revised Edition (2004) WRI/WBCSD.



## **2. Background — California's Oil and Gas Industries**

The oil and gas industries may be broken down into a number of sub-sectors ranging from exploration to retail sales. With the exception of exploration activities and oil wells producing associated natural gas, the oil and gas industries are two distinct industries in California with very different emission sources and business structures. This section provides a brief summary of the oil and gas industries in California to illustrate the emission producing activities for each industry and the business organizations that are responsible for them. As will be seen, all sub-sectors of the oil and gas industries are represented in California.

### **2.1 Natural Gas Industry**

The natural gas industry can be divided into the following GHG emission producing activities:

- Exploration
- Production
- Pipeline transport to and from the processing plant
- Natural gas processing
- Storage
- LNG imports (receiving and re-gasification terminals)
- Pipeline distribution to end-users

California currently produces approximately 15 percent of the natural gas consumed in the state. In-state production peaked in 1985 at approximately 7 trillion cubic feet and subsequently reached a historic low of 290 billion cubic feet in 1996. Production in recent years has been in the 350 billion cubic feet range. While peak California production levels are not expected to return, in-state production is an on-going activity with 1200 producing wells. Most (75%) of the in-state natural gas comes from Southern California and is associated gas (comes from a crude oil well) while the balance is non-associated gas produced in Northern California from large gas fields.

Before the produced raw gas is sent to a nearby processing plant through gathering pipelines, the oil and condensates (including water) are removed at the wellhead. At the processing plant, the gas is transformed into pipeline quality natural gas. The process includes: dehydration (removing water vapor in solution), separation of natural gas liquids (NGLs – a valuable hydrocarbon byproduct), and removal of sulfur and carbon dioxide. From the processing plant, the gas enters the transmission pipeline system and flows to storage fields or through distribution pipelines to the end user.

Because only 15 percent of the natural gas consumed in California is produced in-state, the dominant natural gas industry activities are transmission, storage and distribution to end users. Most of the natural gas consumed in California is imported from the Rocky Mountains, Southwestern states, and Canada via the interstate natural gas pipeline system. Five pipelines make up the interstate system: Gas Transmission Northwest Pipeline, Kern River Pipeline, Transwestern Pipeline, El Paso Pipeline, and the Mojave Pipeline. The ownership of these pipelines is complex. For example, the Transwestern Pipeline Company, based in Houston, Texas is wholly owned and operated by Cross Country Energy, LLC which is owned by CCE Holdings, which is a joint venture of Southern Union Company and GE Commercial Finance’s Energy Financial Services.

Most of the imported natural gas is delivered to the PG&E and SoCalGas intrastate transmission pipeline system, commonly referred to as the “backbone pipeline system”. PG&E and SoCalGas are not allowed to own natural gas production facilities – they are required by law to purchase natural gas from producers and marketers. From here, it is either delivered directly to large non-core customers, into the local transmission and distribution pipeline systems, or to storage fields. Some of the imported natural gas goes directly to large consumers, bypassing the backbone system.

As demand for natural gas continues to increase, California can expect to begin importing LNG to supplement the traditional out-of-state supplies. The LNG will be imported by tanker ship, re-gasified, and stored at ports where it would ultimately be transferred to the utility pipeline system.

Users of a natural gas industry GHG reporting protocol include the following types of entities:

Activity	Reporting Entity
Gas/crude oil exploration and production operations	Major oil companies, independent oil and gas producers, contracting drilling and production companies.
Pipeline transport from wells to processing. Natural Gas Processing	Major oil companies, independent oil and gas producers and independent natural gas processors.
Interstate gas transport	Interstate pipeline owners.
LNG transport, re-gasification storage, transfer	LNG importers, ports.
Intrastate transport and distribution	PG&E, SoCalGas, local utilities
Natural gas storage	Producers, utilities

## 2.2 California Oil Industry

Like the natural gas industry, all steps in the oil production process from exploration to retail sales are present in California. California produces approximately 40 percent of the crude oil refined in the state. There are over 45,000 producing oil wells located in San Joaquin Valley, Los Angeles, Long Beach, Orange County and along the central coast. Offshore wells are located off of Santa Barbara, Ventura, San Luis Obispo and Huntington Beach. The offshore production in California waters (within 3 miles of the shore) represents approximately 6 percent of California's total crude production<sup>5</sup>.

Approximately 60 percent of the crude oil refined in the state is imported by marine tanker to major ports in Northern and Southern California. An extensive pipeline system transports crude oil from production areas and the ports to refineries. The major crude oil pipelines are: All American, Chevron, Four Corners, Mobil, Shell, Texaco, Unocal, and ARCO<sup>6</sup>. In 2004, there were 24 major refineries in California with total distillation capacity of nearly 725 million barrels per year. These refineries operate at nearly maximum capacity to produce sufficient refined product for California.

At present, only small amounts of refined product are imported into California, but this is projected to increase as demand continues to rise and there are no plans to expand in-state refining capacity. Refined product is imported through pipelines owned by Calnev, Shell and Kinder Morgan. Refined product is transported from the California refineries to distribution terminals and marine tankers via pipelines and from the distribution terminals to ~10,000 California retail stations via tanker trucks.

California oil industry activities affected by an oil & gas GHG reporting protocol include:

Activity	Reporting Entity
California based crude oil exploration, extraction and production	Major oil companies, independent oil and gas producers, contract drilling and production companies
Crude oil pipeline transport from wells and ports to refineries	Crude pipeline owners/operators
Marine tanker crude transport	Major oil companies, shipping companies
Crude handling operations at ports	Ports
Refinery operations	Major oil companies, independent refiners
Refined product transportation (marine, pipeline, tanker truck)	Major oil companies, independent refiners, pipeline, trucking, and shipping companies.
Retail station fueling operations	Major oil companies, independent retailers

<sup>5</sup> EIA Petroleum Supply Annual 2003 Volume 1, "Production of Crude Oil by PAD District and State".

<sup>6</sup> [www.tonto.eia.doe.gov/oog/info/state/ca.html](http://www.tonto.eia.doe.gov/oog/info/state/ca.html)

### **3. Comparison of CCAR and IPIECA**

This Phase I report compares the IPIECA guidance and the CCAR reporting and certification protocols for the oil and gas industries. The CCAR General Reporting and Certification Protocols as well as the accompanying Guidance document<sup>7</sup> were reviewed and compared to the IPIECA Guidelines for reporting greenhouse gas emissions. The intent was to assist the Energy Commission staff in evaluation of the protocols to determine entity emission reporting boundaries, and guidance for the construction, maintenance, and verification of emission inventories of entities within California's oil and gas sector.

The IPIECA Guidelines document is largely based on the WRI general reporting protocol (many sections are taken directly from the WRI protocol) and the level of detail is consistent with the WRI protocol with phrasing tailored to the oil and gas industry.

The following sections describe the CCAR and IPIECA guidance on key reporting and certification issues and highlight any inconsistencies between them.

#### **3.1 GHG Emission Report Contents**

Both the CCAR reporting protocol and the IPIECA Guidelines provide a list of required and optional reporting elements; these are summarized in Table 1. The term "required" is not entirely accurate for the IPIECA document since it is not a reporting protocol but rather a set of guidelines for entities that could report to one or more of a variety of reporting programs. For the purposes of Table 1, the term "required" is utilized where the Guidelines say entities "should" report these elements.

#### **3.2 Reporting Boundaries**

Before the GHG emission estimation and reporting process can begin, the reporting entity must determine what the organizational, operational, and geographic boundaries are. These boundary concepts are discussed in both documents and generally have the same meanings though the recommended reporting approaches are slightly different. The following subsections explain each type of boundary and compare the IPIECA and CCAR protocols for each of these boundaries.

<sup>7</sup> CEC Report "Guidance to the California Climate Action Registry General Reporting Protocol", June 2002.

**Table 1. Comparison of Required Reporting Elements.**

Reporting Element	IPIECA Guidelines	CCAR Reporting Protocol
Kyoto Protocol GHGs (CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFC, PFC, SF <sub>6</sub> )	Required individually and on a total CO <sub>2</sub> - equivalent basis. Other GHGs optional.	CO <sub>2</sub> only for first 3 years. For 4 <sup>th</sup> & subsequent years, all required individually and on a CO <sub>2</sub> -equiv basis. Other GHGs optional.
Direct emissions from stationary and mobile combustion, process and fugitives.	Requires reporting of “material” direct emissions.	Requires reporting of “significant” direct emissions.
Indirect emissions from purchased electricity, heat, steam cooling.	Optional	Required
Other Indirect emissions	Optional	Optional
Boundaries (Organizational, operational, geographic)	Required (not geographic)	Required
Baseline	Optional	First year reporting all 6 GHGs is defacto baseline – other years may be selected.
Normalized Emissions	Required	Optional
Description of quantification method	Required	Must provide to certifier.
Qualifications to data	Required	Silent
Context for changes	Required	In baseline maintenance.
Emissions associated with exported energy (separately)	Required	Required only as part of direct emissions.
Emission reductions due to projects	Required	Silent
Reductions banked, sold, purchased.	Required	Not applicable.
Emissions from biologically sequestered carbon (e.g. biomass comb)	Required	Silent
Emissions from geologically sequestered carbon	Required	Silent
GHG management or reduction programs	Required	Optional
Verification/certification of results	Verification optional	Required
Discussion of inventory quality	Optional	By certifier.

### 3.2.1 Organizational Boundaries

A reporting entity is an entity in its entirety, such as a corporation or other legally constituted body. Operations that are within a reporting entity’s organizational boundary are essentially the operations/emissions that the entity claims responsibility for. Both the IPIECA Guidelines and the CCAR Protocol describe two different organizational reporting approaches: equity share and operational control<sup>8</sup>. Briefly, the equity share approach requires a reporting entity to report GHG emissions from all sources that it has equity in by applying its percent ownership of each source to the sources’ annual emissions. The operational control approach requires a reporting entity to report 100 percent of the GHG emissions from sources it has operational control over, regardless of equity position. If a reporting entity has equity in but does not have operational control over a source, it does not report the source’s emissions.

For joint ventures, it may be difficult to determine which entity has operational control. One can envision many different criteria for determining which entity in a joint venture has operational control. Table 2 shows the IPIECA and CCAR criteria for determining operational control of a joint venture – the criteria are essentially the same.

**Table 2. Operational Control Criteria for Joint Ventures**

IPIECA Operational Control Criterion	CCAR Management Control Criteria
The company has authority to introduce and implement its operational and environmental, health, and safety (EHS) policies.	Reporting entity has management control if it has control over operational, health, safety, and environmental policies.
Except in rare circumstances, company holding the operating license has operational control.	Control > 50% of voting interest whether by equity, agreement/contract.

Whichever method is chosen, both IPIECA and CCAR state that this method must consistently be used for all GHG sources and ideally year to year. The IPIECA document does not advocate either organizational boundary approach. Rather, it encourages entities to disaggregate their emissions quantification down to the emission source level, and then roll the emissions up  with the equity share and operational control accounting methods. In this way, entities have sufficient accounting flexibility to participate in any program (whether chosen or mandated). For these same reasons, the current CCAR Protocol encourages using both the management control and equity share approaches although the reporting tool, CARROT, assumes the management control approach.

<sup>8</sup> The CCAR General Reporting Protocol uses the term “Management Control” for “Operational Control”. In this report, the two terms are used interchangeably.

Although California has large complex multi-national corporations in the oil and gas industry, its parts still may be broken down into the commonly encountered business arrangements that the CCAR and IPIECA/WRI general reporting protocols address. Complexity arises because a reporting entity may have many joint ventures and subsidiaries under it that in turn also have formed joint ventures and own subsidiaries. The IPIECA document describes petroleum industry organizational relationships in their Table 3-1 and a description of how emissions would be reported on an equity share basis. Table 3 below draws on this table and adds a column for organizational control reporting.

The only atypical relationship is the Production Sharing Agreement (PSA) which is commonly used in exploration and production activities. The IPIECA document focuses on PSA arrangements with foreign countries; however this type of arrangement happens within California as well, with a landowner assigning drilling rights in exchange for royalties on any resulting production.

In terms of organizational boundaries, the IPIECA Guidelines and the CCAR protocol are largely in agreement. One exception is the case where the reporting entity owns between 1 and 20 percent of a publicly traded company. The IPIECA Guideline advises that the reporting entity need not report any of these emissions, regardless of whether it reports on a management control or equity share basis. Alternatively, the CCAR protocol requires a reporting entity that utilizes the equity share approach to report its equity share of the company's emissions when the equity share is between 1 and 20 percent. If the reporting entity utilizes the management control approach, then under the CCAR protocol the entity would not report any emissions. There are large petroleum companies that likely own between 1 and 20 percent of another sizable entity which may or may not quantify and provide its emissions data to the reporting entity. This requirement may preclude the use of equity share reporting for large oil companies.

One subtlety that is not addressed by the IPIECA document but is mentioned in the CCAR protocol is the case when a reporting entity has joint control and ownership with another entity of an emission source. The CCAR protocol states that when both management control and equity are equally divided between two or more owners, emission reporting should be done on an equity share basis for this source. In this case the CCAR allows the equity share and management control accounting methods to be mixed.

**Table 3. Common Petroleum Industry Investment Structures (based on IPIECA Guidelines Table 3-1).**

Type of Investment	Description of Organizational Relationship	Operational Control Reporting	Equity Share Reporting
Subsidiary	The reporting entity either wholly owns the subsidiary, or enough of its voting stock that it has full control of the subsidiary.	Reporting entity has management control and therefore reports 100% of subsidiary's emissions.	Reporting entity reports its equity share of the emissions.
Joint venture among two or more companies that operates as a separate company.	Several corporations have formed a company by combining some of their existing assets and/or capital. The several corporations are the sole shareholders.	<ul style="list-style-type: none"> <li>• If an entity has &gt;50% ownership, it has financial control implying management control. This entity reports 100% of the GHG emissions.</li> <li>• If an entity owns &lt; 50%, but has management control (by agreement, majority of votes, etc.), this entity reports 100% of the GHG emissions.</li> <li>• <i>If ownership and operation is evenly divided among entities, GHG emissions are reported on equity share basis.</i></li> </ul>	The reporting entity reports its equity share of the emissions.
Joint venture among several companies to develop a production facility.	Corporations work in partnership without forming a new company. One serves as operator.	If the reporting entity is the operating partner, it would report 100% of the emissions. If not, it would not report these emissions.	The reporting entity reports its equity share of the emissions – typically according to the working interest.
Joint venture between a landowner and one or more companies to produce oil/gas in a production sharing agreement (PSA)	Landowner assigns drilling rights to others in exchange for royalty payments on any resulting production.	Typically the landowner little operational control and would report no emissions. The entity with management control would report all GHG emissions. In the event ownership and management is evenly divided, reporting would be on an equity share basis.	The reporting entity would report emissions based on the share of production (net production if owner is paid in-kind with oil).
Stock ownership in a publicly traded corporation – significant share of ownership.	A separate public company in which the reporting entity has ≥ 20% ownership.	The reporting entity is not required to report these emissions, but may coordinate with other entities to report on a pro-rata basis (coordinate to ensure no underreporting or double counting of emissions).	The reporting entity reports its equity share of the emissions.
Stock ownership in a publicly traded corporation – small share of ownership	A separate public company in which the reporting entity has < 20% ownership.	Reporting entity would not report any of these emissions.	<ul style="list-style-type: none"> <li>• The IPIECA Guidelines say reporting entity does not report any GHG emissions.</li> <li>• The CCAR protocol says emissions must be reported for equity from 1% to 99%.</li> </ul>

### 3.2.2 Operational Boundaries

The term operational boundary is used by both the IPIECA Guidelines and the CCAR Protocol. This essentially means determining the emission sources that must be reported. GHG emissions are divided into two types: direct emissions and indirect emissions. Direct emissions come from sources that are owned or controlled by the reporting entity. Indirect emissions are emissions that occur because of the reporting entity's actions but are not produced by the reporting entity.

Table 4 provides a comparative list of direct emissions that are explicitly called out in the CCAR protocol and the IPIECA Guidelines. As might be expected, the IPIECA protocol includes specific oil and gas industry emission sources. The CCAR General Protocol should probably add flares and fired equipment to its list. Inclusion of incinerators by IPIECA is likely covered in CCAR's stationary combustion for the production of heat, steam or electricity. In developing an oil and gas protocol, CCAR may want to provide a more comprehensive list of direct emission sources.

**Table 4. Comparison of Required Direct Emission Sources**

CCAR Protocol	IPIECA Guidelines
Stationary combustion for the production of heat, steam or electricity.	Stationary combustion for production of heat, steam, or electricity.
	Combustion in flares and incinerators.
	Production of work by engines and turbines (e.g. to drive pumps/compressors)
Process emissions (such as from cement, adipic acid, ammonia, agricultural, etc.)	Process emissions (gas processing, oil refining, petrochemical manufacture)
Mobile combustion (i.e., cars, trucks, rail, air, and other transport) owned or controlled by entity and used for moving raw materials, finished products, supplies, people.	Transportation in company-owned motor vehicles and vessels, such as tank trucks and oil tankers
Fugitive emissions (pipeline leaks, HFCs from air conditioners, etc)	Fugitive losses from equipment leaks such as gas pipeline systems.

While the CCAR protocol requires reporting of indirect emissions from purchased energy (electricity, steam, heating and cooling), the IPIECA guidelines treat indirect emissions as optional reporting elements. Table 5 provides a comparison of explicit examples of indirect emission reporting requirements. The IPIECA guidelines have more oil and gas industry specific examples of indirect emissions; these are optional (though encouraged) reporting items in the IPIECA guidelines.

**Table 5. Comparison of CCAR and IPIECA Indirect Emissions Sources**

	<b>CCAR Protocol</b>	<b>IPIECA Guidelines</b>
Purchased electricity	Required	Encouraged
Purchased steam/heating/cooling	Required	Encouraged
Production & transport of purchased raw materials	Optional	Minor: only report if have specific need.
Outsourced activities, contracting	Optional	Optional
Manufacture and transport of imported hydrogen for refining operations	Subset of raw material transport (optional)	Encouraged
Third party shipping of crude and products in vessels, truck, rail, pipeline up to point of sale	Subset of outsourced activities (optional)	Encouraged
Contracted exploration and production (well drilling, maintenance and workovers)	Silent	Encouraged
Toll manufacture of chemicals by third party.	Subset of outsourced activities (optional)	Encouraged
Off-site waste disposal including transport	Optional	Minor: only report if have specific need.
Employee commuting, business travel	Optional	Minor: only report if have specific need.
Product use	Optional	Should be reported by end-user, especially for oil & gas industry
Product disposal	Optional	Silent

The treatment of emissions associated with losses along electric transmission and distribution lines, generally assumed to be 7 percent, is consistent between the IPIECA Guidelines and the current version of the CCAR protocol. These emissions are assigned to the owners of the transmission and distribution lines. Earlier versions of the CCAR protocol had assigned the line losses to the end user.

Emissions from leased facilities/sources are a reporting issue on which the IPIECA guidelines and the CCAR protocol differ. Possible leased equipment direct and indirect emissions include:

- Industrial operations in a leased building
- Fuel consumed by leased vehicles
- Leased equipment
- Electricity metered and paid for by the reporting entity in a leased office building

CCAR requires that these emissions be quantified and reported as if they were wholly-owned by the reporting entity. Therefore, regardless of whether the entity is utilizing the equity share or operational control approach, 100 percent of these emissions must be reported. The IPIECA Guidelines state that if the reporting entity utilizes the operational control accounting approach, 100 percent of the emissions from leased sources must be reported. However, if the reporting entity utilizes the equity share approach, it would only report emissions for leased sources if the lease is a finance or capital lease. No leased source emissions would be reported under the equity share approach if the lease is an operational lease. The IPIECA Guidelines state:

*A finance or capital lease is one that transfers substantially all the risks and rewards of ownership to the party leasing property from its owner. Such leases are treated as assets in financial accounting and are recorded as such on the balance sheet. The party leasing an emissions source under a financial or capital lease should therefore account for GHG emissions as if it owned the source...*

*... [in an operational lease] no liabilities or assets are recorded in financial accounting. The party leasing the emissions source should not report GHG emissions produced by operational leases.*

The IPIECA Guidelines go on to state that most leases will be capital leases, however rented office space is an operational lease and emissions from this category would not be reported under the equity share approach.

### **3.2.3 Geographic Boundaries**

The IPIECA Guidelines do not discuss geographic boundaries since it is not a protocol for a specific reporting/trading scheme. The CCAR protocol requires all emissions in California to be reported and encourages reporting of emissions from all activities in the United States. It is also possible to report emissions from activities outside of the United States in the optional reporting area of CARROT. For California-only reporting, CCAR provides the following guidance:

- Indirect emissions from electricity consumption in California are reported regardless of the fact that the direct emissions from electricity production may occur outside of California.
- Direct GHG emissions from all mobile sources based (licensed/registered) in California should be reported.
- Direct emissions associated with refueling for mobile sources based outside of California for fuel used in California.

One thing that might be included in an oil and gas industry protocol is an explicit definition of what off-shore activities should be considered within California and the United States.

### **3.3 Reporting Principles**

Both the IPIECA and CCAR documents have several overarching principles in common that are intended to guide preparation of GHG emission inventories and reporting. These are completeness, consistency, accuracy and transparency. Each of these principles is discussed in the following sections, with differences between the two documents highlighted.

#### **3.3.1 Completeness**

One of the principles fundamental to any emission reporting program is the concept of completeness. Ideally, the reporting entity would make an effort to quantify and report emissions from all sources within its chosen boundary. In practice however, GHG accounting can be an expensive, ongoing undertaking. It can be argued, especially for large reporting entities, that it does not make sense to account for each individual emission source if it will make a negligible contribution to total emissions.

Recognizing this, both the CCAR protocols and the IPIECA Guidelines provide for omitting non-material or insignificant emissions though different approaches are utilized. The CCAR protocol requires reporting entities to report at least 95 percent of their GHG emissions. The entity must estimate emissions from all sources and if one or more sources sum up to less than 5 percent of total emissions, the entity is not required to report these “de minimis” or “non-significant” emissions. This approach allows reporting entities to use less detailed and presumably less time consuming and/or costly methods to conservatively estimate emissions from their smallest sources. However, for the first reporting period in which a source is defined as de minimis, emissions must be quantified sufficiently to allow the certifier to agree that emissions are de minimis.

Although the IPIECA/WRI approach rejects the de minimis concept, their guidelines acknowledge that reporting entities will make decisions to not report certain smaller sources due to the resources required to quantify their emissions. These smaller sources are assumed to contribute insignificantly (non-materially) to the total emissions reported by the reporting entity. These omissions are considered to be non-material. If no materiality threshold is set by the program in which the reporting entity participates, it is up to the independent verifier to determine whether the omissions are material or not.

One could therefore conclude that both the CCAR and IPIECA documents allow de minimis emissions to go unreported but the CCAR quantifies the allowable omission while IPIECA allows the individual verifiers determine the limit on a case by case basis.

### 3.3.2 Consistency: Establishing and Maintaining a Baseline

Both the IPIECA Guidelines and the CCAR protocol discuss the concept of establishing and maintaining a GHG emission baseline. The IPIECA Guidelines document encourages reporting entities to establish a baseline so that emission reduction progress can be tracked over time. The IPIECA Guidelines do not make a specific recommendation as to which year to select as a baseline year – it simply states that the emissions data must be verifiable, allow for consistent estimation and accounting across the company, and be consistent with the requirements of the program to which the entity is reporting.

The CCAR protocol states “at this time, participants are not *required*, but are *encouraged* to establish a baseline reporting year”. If a participant chooses to select a baseline year, the first year of reporting all 6 GHGs (fourth reporting year) is the default baseline year, but any other year with certified data may be selected as the baseline year.

Once an entity has selected a baseline year against which to compare emission increases or decreases, the baseline needs to be “maintained” to ensure that for each subsequent year it is a fair comparison to reported emissions. Both the IPIECA and CCAR documents provide guidance on when the baseline needs to be adjusted. Specific direction on baseline emission adjustments are provided in Table 5. In general, the two documents agree that the baseline should not be adjusted for “organic growth or decline” which is defined by the CCAR protocol as follows:

*Organic growth or decline refers to the increase or decrease in production output, changes in product mix, plant closures, and the opening of new plants that are not the result of changes in the structure of the participant’s organization or the result of shifting operations into or out of California or the United States.*

From Table 5 it may be seen that both documents agree on baseline adjustments. The IPIECA protocol discusses outsourcing and insourcing at length, stating that if a company tracks both direct and indirect emissions, outsourcing/insourcing will not change the total baseline emissions. The CCAR protocol says that in practice, there will be a direct baseline, an indirect baseline, and a total baseline. Outsourcing and insourcing will affect the direct and indirect baselines, but the total will not be adjusted.

The CCAR protocol advises that a participant need not adjust the baseline if it has changed by 10 percent or less. This is a cumulative change e.g. if it changes by 4 percent each year for three years, the baseline would need to be adjusted the third year since the cumulative change will be 12 percent. The certifier must verify the change in baseline emissions each year. The IPIECA document makes no recommendation on how often the baseline needs to be updated, only that it needs to be updated when there has been a “significant” change.

**Table 5. Direction on Baseline Adjustment**

	CCAR Protocol	IPIECA Guidelines
Mergers, acquisitions, divestitures	Adjust	Adjust if came into existence before reporting entity set baseline year.
Outsourcing activities	Adjust if previously conducted internally.	Adjust if operations came into existence before the base year was set.
Insourcing activities	Adjust if previously contracted to outside parties.	Adjust if operations came into existence before the base year was set.
Shifting emissions into or out of geographic boundaries	Adjust	Silent
Improved GHG accounting methodologies	Adjust	Adjust
Discovery of errors	Silent	Adjust if significant.
Organic growth or decline	Do not adjust	Do not adjust

### 3.3.3 Accuracy

The CCAR protocols require that emission reports be free of material misstatements, achieving a level of at least 95 percent accuracy. CCAR distinguishes between inherent uncertainty and reporting uncertainty. Inherent uncertainty is the uncertainty in emission factors and monitoring/recording activity data. Reporting uncertainty is due to misidentification of emissions sources (leaving some out), data handling errors and emission miscalculations. CCAR requires that the reporting uncertainty be maintained at 5 percent or less.

During the certification process, the certifier may find a discrepancy between the reported emissions and those estimated by the certifier. According to the CCAR protocol, if the total emissions estimated by the certifier are more than 5 percent higher or lower than the total emissions estimated by the reporting entity then the discrepancy is defined as a *material discrepancy*, and the emission report is not certifiable until the certifier and reporting entity can resolve the difference.

The IPIECA Guidelines advises that GHG estimates “should be systematically neither over nor under the true emissions value, as far as can be judged, while recognizing the need to balance the cost-effectiveness of obtaining accurate emissions estimates with the intended use for the emissions information”. The IPIECA Guidelines later define *material discrepancy* as an error (either an oversight, omission, or miscalculation) that results in the reported quantity being sufficiently different from the true value that it

influences decisions or actions. While the IPIECA Guidelines document does not specify a materiality threshold, it does acknowledge that a threshold, predefined by a reporting program, is a useful guide to verifiers.

One may conclude that the CCAR and IPIECA Guidelines are consistent on the concept of accuracy.

### 3.3.4 Transparency

The IPIECA Guidelines document defines transparency as “the degree to which information on the processes, procedures, assumptions, and limitations of the GHG inventory are disclosed”. A high degree of transparency is endorsed. The IPIECA Guidelines document states that an independent external verification is a good way to increase transparency and ensure that an audit trail has been established.

The CCAR ensures transparency by requiring participants and to report their emissions with the on-line reporting tool (CARROT) and to have their emissions certified by an independent third party.

## 3.4 Certification and Verification



The terms “certification” (used in the CCAR protocol) and “verification” (used in the WRI and IPIECA documents) are used interchangeably in this report and mean the process of having an independent third party perform an audit of a reporting entity’s GHG emission inventory. The section on verification in the IPIECA Guidelines is a condensed version of the verification chapter in the WRI GHG protocol. The WRI/IPIECA Guidelines encourage verification, and essentially refer the reporting entity to the verification requirements of the specific program to which it reports.

**TIAX does not discuss IPIECA’s recommendations for data aggregation (aggregation ong operational boundaries, aggregation along other dimensions). Data aggregation at one or more levels between individual sources and the entire corporation is commonly required for programs that involve GHG reporting.**